ENVIRONMENTAL ENGINEERING, INC
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September 7, 2006

Mr. Kevin D. Brown, PG
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, California 94612

Subject: **File No: 07-0733 (KEB)** 2185 Solano Way, Concord, California

Dear Kevin:

Enclosed please find SOMA's "Work Plan for Additional Site Assessment " at the subject site location. This report has been uploaded to the State's GeoTracker database.

Thank you for your time in reviewing our report. Please do not hesitate to call me at (925) 734-6400, if you have any questions or comments.

Sincerely,

Mansour Sepehr, Ph.D., PE
Principal

Enclosure

cc : Mr. Marcus Shimoff
c/o Mr. Terry Horn w/enclosure

Ms. Sue Loyd w/enclosure
CCCHSD
4333 Pacheco Blvd.
Martinez, CA 94553

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Work Plan for Additional Site Assessment
at
2185 Solano Way, Concord, California
File No. 07-0733 (KEB)

Project 2460

September 7, 2006

Prepared for

Mr. Marcus Shimoff
Shimoff and Lager
c/o Mr. Terry Horn
405 Primrose Road, Suite 300
Burlingame, California

Prepared by

SOMA Environmental Engineering, Inc.
6620 Owens Drive, Suite A
Pleasanton, CA 94588

CERTIFICATION

This technical report is hereby submitted by SOMA Environmental Engineering, Inc. on behalf of Mr. Marcus Shimoff, c/o Mr. Terry Horn, Trustee of the property located at 2185 Solano Way, Concord, California. This report has been prepared in response to the California Regional Water Quality Control Board – San Francisco Bay Region's request, as specified in their July 11, 2006 letter *Requirement for Work Plan – 2185 Solano Way, Concord, California.*

Mansour Sepehr, Ph.D., P.E.
Principal Hydrogeologist

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1.0 INTRODUCTION

This work plan has been prepared by SOMA Environmental Engineering, Inc. (SOMA) for the purpose of conducting an additional site assessment at 2185 Solano Way, Concord, California (the Site). This work plan was requested by the California Regional Water Quality Control Board – San Francisco Region (RWQCB-SFB) in their correspondence to Mr. Marcus Shimoff c/o Mr. Bert Horn, Trustee of the Site, dated July 11, 2006.

1.1 Site Location and Description

The Site is a former Beacon service station located in a mixed residential and commercial use area in Concord, California (Figure 1). The Site is currently vacant with no business activity.

1.2 Environmental Assessment Background

In December of 1998, four gasoline underground storage tanks (USTs) with capacities of 10,000 gallons, 8,000 gallons, 5,000 gallons, and 4,000 gallons were removed from the Site. Soil samples collected from beneath the USTs and sidewalls of the excavated areas contained elevated levels of petroleum hydrocarbons. In October 1999, RRM, Inc. (RRM) completed soil over-excavation and disposal activities at the Site. Approximately 7 cubic yards of petroleum hydrocarbon impacted soil was excavated from the former southeastern fuel island area. Figure 2 illustrates the locations of the former USTs and fuel islands.

On March 14, 2000, RRM installed three on-site shallow groundwater monitoring wells (MW-1, MW-2, and MW-3). The locations of these monitoring wells are illustrated on Figure 2. Quarterly groundwater monitoring began at the Site in March 2000.

On September 22, 2000, SOMA drilled soil borings (B-1 to B-6) and collected soil and grab groundwater samples from beneath the Site and neighboring properties. On October 10 and 11, 2000, SOMA drilled 3 additional soil borings off-site. The soil borings were converted into monitoring wells (MW-4, MW-5, and MW-6). The locations of the monitoring wells are illustrated on Figure 2.

On April 17, 2001, SOMA conducted a door-to-door sensitive receptor survey within a 500-foot radius of the Site. The field personnel went door-to-door canvassing the residential and commercial properties. During this survey, SOMA visited over 35 properties. Of these properties, most residents were not home or did not answer the door; 12 reported that they have no wells; and some others did not know if they had wells, which, in the case of single family residences, such as most of the properties closest to the Site, typically indicates that there is no well water use. None of the properties surveyed indicated that any wells were in use.

At the State Department of Water Resources (DWR), SOMA found records of nine wells constructed within the two apportionment districts containing the area within 500 feet of the Site (this is a much larger area than the area of interest). Only one of these wells was labeled for domestic water use and is located over 6,000 feet east of the Site. The other eight wells were irrigation wells, and none of them were located within the 500-foot radius area of interest.

In May 2001, hydropunches (HP-1 to HP-8) were drilled and soil and groundwater samples were collected. The results of this investigation revealed the presence of elevated levels of petroleum hydrocarbons and Methyl tertiary Butyl Ether (MtBE) in the groundwater. The locations of the hydropunches are illustrated on Figure 2.

In June 2001, SOMA completed a Risk-Based Corrective Action (RBCA) analysis for the Site, which indicated that the Site is a “High Risk” petroleum release site. A sensitive receptor survey within 500 feet of the Site and further site characterizations were also conducted. SOMA set up a groundwater flow and chemical transport model to design a groundwater extraction system for the Site. SOMA further proposed the installation of an off-site groundwater extraction well at 2837 Eastgate Avenue. In July 2001, SOMA prepared and submitted a Corrective Action Plan (CAP) to the RWQCB-SFB.

In January 2002, two CPT holes were logged (one on-site and one off-site to the southwest), four grab groundwater samples were collected from each of the two CPT locations, and two piezometers were installed on-site. PZS-1 was screened in the first water-bearing zone and PZS-2 was screened in the second water-bearing zone. This investigation was used to evaluate the vertical extent of the on- and off-site chemical plume in the subsurface and to determine the hydrogeologic conditions beneath the on- and off-site areas. A confirmation boring was drilled adjacent to the CPT-1 location to collect soil samples from selected depths for comparison with the CPT lithologic logging. The locations of the CPTs and piezometers are illustrated on Figure 2.

Previous assessments have revealed the presence of elevated levels of dissolved-phase hydrocarbons and MtBE. Over the period of record for quarterly groundwater monitoring, concentrations of MtBE in the existing groundwater monitoring wells have significantly decreased. Presently, the highest dissolved-phase gasoline oxygenate concentrations, which include MtBE and tert-Butyl-Alcohol (TBA), appear to be located in the southwestern section of the Site, and extend off-site to the southwest.

1.3 Remediation Background

In December 2002, SOMA oversaw the installation of a French drain and extraction well (EX-1); their locations are illustrated on Figure 2. The remediation

system initially began operating in October 2003. The treated groundwater was discharged under the requirements of Order 01-100, NPDES Permit No. CAG912002. During the April 15, 2004 sampling event, TBA was detected in both the influent and effluent of the remediation system. The RWQCB-SFB was notified about the breakthrough of TBA into the effluent of the treatment system and the treatment system was shutdown.

On June 1, 2004, based on the approval of the RWQCB-SFB and the difficulty in removing TBA in groundwater with activated carbon, the NPDES was terminated and the treated groundwater was discharged into the on-site sewer main. Currently, the treated groundwater is being discharged under the Central Contra Costa (CCC) Sanitary District's guidelines.

In May 2003, a free product removal program was enacted. Free product was actively removed from wells MW-2, MW-2R, and MW-3 by using a 2-inch passive skimmer (model number TR-252). On March 8, 2006, the passive skimmer was removed from the Site. Approximately 29.38 gallons of free product and contaminated groundwater was removed from the Site from May 2003 to March 2006. Due to only a sheen being observed in the wells from January 2006 to March 2006, the free product program was terminated.

Approximately 2,164,575 gallons of groundwater has been treated and discharged at the Site (as of June 15, 2006). The cumulative masses of total petroleum hydrocarbons as gasoline (TPH-g), MtBE, and benzene extracted from the groundwater by the treatment system are approximately 129.50 pounds, 89.90 pounds, and 5.51 pounds, respectively.

2.0 SITE HYDROGEOLOGY

The Site is located in the eastern San Francisco Bay area. San Francisco Bay occupies a physiographic depression in the earth's crust, which is bordered on the east and west by roughly parallel mountain ranges located within the Coast

Range geomorphic province. The folding and faulting that produced the mountains and troughs occurred during the Pliocene to mid-Pleistocene time and continue today. Geologically, the Site and surrounding areas are filled by alluvial deposits containing gravel, sand, silt and clay eroded from the surrounding mountains. Local geology in the vicinity of the Site is characterized by the presence of Pleistocene and recent alluvial and marine sediments consisting of weakly consolidated, poorly sorted clastic deposits.

Previous assessments conducted by SOMA in early 2002 identified three water-bearing zones separated by aquitards situated beneath the Site and immediate vicinity. The first water-bearing zone (WBZ-1) is comprised of silt and clay and extends to a depth of between approximately 16 and 17 feet below ground surface (bgs). The existing groundwater monitoring wells on the Site and in the immediate vicinity are completed in WBZ-1. Underlying WBZ-1 is an aquitard that extends from approximately 16 to 27 feet bgs that is also comprised of silt and clay. Beneath this aquitard is the second water-bearing zone (WBZ-2) that extends from approximately 24 to 37 feet bgs and is comprised mostly of sand with silt and clay. WBZ-2 is underlain by an aquitard that extends from approximately 36 to 49 feet bgs comprised mostly of silt and clay. The third water-bearing zone (WBZ-3) extends from approximately 44 to 57 feet bgs and contains sand and gravel with silt and clay. WBZ-3 is underlain by an aquitard of unknown thickness comprised of silt and clay. SOMA installed piezometers in WBZ-1 (PZ-1) and WBZ-2 (PZ-2) in early 2002 to evaluate vertical flow between WBZ-1 and WBZ-2. The locations of the piezometers are illustrated on Figure 2. Groundwater elevation measurements collected from the piezometers indicated a vertical groundwater gradient downward from WBZ-1 to WBZ-2.

Over the period of quarterly monitoring conducted at the Site, groundwater in WBZ-1 occurs at 8 to 13 feet bgs. The groundwater in WBZ-1 flows to the southwest at an average groundwater flow gradient of approximately 0.005 ft/ft. The hydraulic conductivity of the saturated material is about 14 feet per day. The

porosity of the saturated material is about 0.35. Therefore, the groundwater flow velocity is approximately 0.2 ft/day.

3.0 SCOPE OF WORK

The RWQCB-SFB concluded in their July 11, 2006 correspondence that although active remediation has been undertaken at the Site, including groundwater pump and treatment and the removal of free product from several monitoring wells, the lateral extent of the hydrocarbon contamination in the groundwater has not been defined. The RWQCB-SFB further directed that a work plan be prepared to address the following items:

- Advance borings and install monitoring wells to further delineate the lateral and vertical extent of hydrocarbons in soil and groundwater,
- Prepare a Site Conceptual Model with appropriate geological cross-sections,
- Prepare an up-to-date conduit study, and,
- Perform a sensitive receptor survey, including a door-to-door survey, to identify domestic or municipal wells within a 1,000-foot radius of the Site.

In order to comply with the requests of the RWQCB-SFB to further delineate the lateral and vertical extent of hydrocarbons in the soil and groundwater, SOMA proposes advancing 9 borings to collect grab-groundwater samples from each of the three water-bearing zones at the locations illustrated on Figure 2 (HP-9 through HP-17). The borings are intended to limit the lateral extent of dissolved-phase hydrocarbons in WBZ-1, and to limit the vertical extent of dissolved-phase hydrocarbons in WBZ-2 and WBZ-3. Additional borings may be warranted based on the results of the Conduit Study to be conducted as part of this work plan. Based on the lithologies encountered in the borings, and the results of the laboratory analyses conducted on the grab-groundwater samples collected from the three WBZ at each boring location, groundwater monitoring wells will be installed to bound and monitor the lateral and vertical extent of impact in the

three WBZ. The groundwater monitoring wells will be incorporated into the on-going quarterly monitoring program for the Site.

Boring HP-9 is intended to limit the extent of dissolved-phase hydrocarbon impact downgradient from the Site, and cross-gradient from existing groundwater monitoring well MW-4. Boring HP-10 is intended to limit the extent of impact downgradient from existing groundwater monitoring well MW-4, and cross-gradient from existing groundwater monitoring well MW-6. Boring HP-11 is intended to limit the extent of impact downgradient from existing groundwater monitoring well MW-6. Boring HP-12 and HP-13 are intended to limit the extent of impact downgradient from existing groundwater monitoring well MW-6, MW-5 and existing extraction well EX-1. Boring HP-14 and HP-16 are intended to limit the extent of dissolved-phase hydrocarbon impact in the vicinity of existing groundwater monitoring well MW-5 and existing extraction well EX-1, and existing groundwater monitoring well MW-3, respectively. Boring HP-15 and HP-17 are intended to limit the extent of impact cross-gradient from the Site.

Grab-groundwater samples will also be collected from existing piezometers PZS-1 (completed in WBZ-1), and PZS-2 (completed in WBZ-2), both of which are located in the northeast corner of the Site.

Details of the specific scope of work are discussed in the following sections

Task 1: Conduit Study

Task 2: Sensitive Receptor Survey

Task 3: Permit Acquisition, Health and Safety Plan Preparation, and Subsurface Utility Clearance

Task 4: Advance Grab-Groundwater Sample Borings and Collect Groundwater Samples

Task 5: Install Groundwater Monitoring Wells

Task 6: Laboratory Analysis

Task 7: Report Preparation

3.1 Task 1 – Conduit Study

SOMA will investigate locations and depths of underground utilities through telephone interviews and correspondence with utility service providers, and field measurements of accessible utility vaults in the vicinity of the Site. Utility service providers to be contacted will include the following:

- County of Contra Costa, Department of Public Works
- City of Concord, Department of Public Works
- Contra Costa Water District
- Pacific Gas and Electric
- AT&T

Based on utility maps provided by these service providers, SOMA will compile a subsurface utility map showing the location, size and buried depth of underground utilities in the vicinity of the Site (including Broadmoor Avenue, Solano Way, Eastgate Avenue and Courtland Avenue). It is anticipated that the deepest utility trenches in the area will be for water mains, storm drain lines, and sanitary sewer lines. SOMA will measure depths to invert in storm drain and sanitary sewer utility vaults. The results of the Conduit Study will be used to determine whether the underground utilities could provide preferential pathways for or are likely to influence the lateral migration of dissolved-phase hydrocarbons.

3.2 Task 2 – Sensitive Receptor Survey

To evaluate the potential risk to human receptors from consumption of impacted groundwater, SOMA will conduct both an agency and a door-to-door groundwater well survey within a 1,000-foot radius of the Site. The agency survey will be conducted by reviewing well completion records on file at the California Department of Water Resources (DWR), the Contra Costa County Health Department, and the Contra Costa Water District. The door-to-door

survey will be conducted by mailing a Public Health Assessment questionnaire to property owners within a 1,000-foot radius of the Site. The parcels and property owners will be determined through the Contra Costa County Assessor's Office. An example of the questionnaire is included in Attachment 1.

3.3 Task 3 - Permit Acquisition, Health and Safety Plan Preparation, Subsurface Utility Clearance, Traffic Control

3.3.1 Permit Acquisition

Prior to initiating field assessment activities, SOMA will obtain the necessary drilling permits from the Contra Costa County Environmental Health Division, Encroachment Permits from the City of Concord Public Works Department, and an access agreement letter from the owner(s) of the parcel(s) south of the Site.

3.3.2 Health and Safety Plan

A site-specific health and safety plan (HASP) will be prepared by SOMA. The HASP is designed to address safety provisions during field activities and protect the field crew from physical and chemical hazards resulting from drilling and sampling. The HASP establishes personnel responsibilities, general safe work practices, field procedures, personal protective equipment standards, decontamination procedures, and emergency action plans.

3.3.3 Subsurface Utility Clearance

SOMA will notify Underground Service Alert (USA) to clear the drilling areas of underground utilities. Following USA clearance, SOMA will retain a private utility locator to survey the proposed drilling areas and locate any additional subsurface conduits. Immediately prior to the onset of drilling activities, each boring will be hand-augered to a depth of 5 feet below ground surface (bgs).

3.3.4 Traffic Control

Prior to conducting field assessment activities in the public right-of-way (Solano Way, Eastgate Avenue and Courtland Avenue), SOMA will arrange for traffic control in accordance with Caltrans' specifications for lane closure in the public right-of-way.

3.4 Task 4 – Advance Grab-Groundwater Sample Borings and Collect Groundwater Samples

The proposed grab-groundwater sample borings will be advanced using a direct-push drill rig. The intent of each boring is to collect a grab-groundwater sample from each of the three water-bearing zones at each boring location. The approximate depths for collecting grab-groundwater samples are:

WBZ	Sampling Depth (feet bgs)
1	10 to 14
2	30 to 34
3	50 to 54

Each boring will be advanced to 55 feet bgs depending upon the subsurface material encountered. Each boring will be continuously logged. Soil samples will be screened for possible laboratory analyses based on odors, visual observations and screening using a photo-ionization detector (PID).

Per SOMA's experience, groundwater sampling from several water-bearing zones can be accomplished within one borehole. SOMA anticipates that hydraulic heads in WBZ-2 and WBZ-3 will be low, and therefore, each soil boring will be advanced with a Geoprobe™ Dual Tube DT-21 groundwater profiler and soil sampler. This sampling system is ideal for water-bearing zones with low hydraulic head because the sampling chamber can be decontaminated

downhole. Because the lead cone and rods are the same diameter, the sampling system does not create an annulus to allow for aquifer cross-contamination. With this sampling system, soil and contaminant residuum from overlying soil units is easily squeezed off the smooth outside probe surface by lateral confining pressures. The groundwater sampling chamber will also be over-purged, the entire probe will be retrieved, and the sampling chamber will be decontaminated. After groundwater sampling, the boreholes will be tremie grouted from the bottom up, to further reduce the potential for cross-contaminating different water-bearing zones, if any.

Following grab-groundwater sampling, the borings will be destroyed with a neat cement grout mixture tremmied into place as the push rods are removed, and completed at the surface with materials to match the existing grade. Borings in the public right-of-way will be restored in accordance with City of Concord's encroachment permit.

Soil and waste water generated during boring activities will be temporarily stored on-site in separate DOT-rated 55-gallon steel drums pending characterization, profiling and transportation to an approved disposal/recycling facility.

A description of the general field procedures is included in Attachment 2.

3.5 Task 5 – Install Groundwater Monitoring Wells

The locations, depths and completion details of the groundwater monitoring wells will be dependent on the results of Task 4. Each well would be a separate installation completed within a single WBZ. The groundwater monitoring wells will be constructed with 2-inch diameter, Schedule 40 PVC blank casing and well screen with 0.020-inch slotting. Monitoring wells completed in WBZ-2 and WBZ-3 will be installed using a conductor casing that will extend from ground surface to the top of the well screen for each well to eliminate cross-contamination

between the three water-bearing zones. Filter pack material will consist of No. 3 Monterey sand. Well screen intervals will be selected based on field observations during the well borehole drilling. The wells will be developed by surging and bailing. A California-licensed land surveyor will survey the wells to determine latitude, longitude, and top of casing elevation relative to the California State Coordinate system, Zone II (NAD 83) and Benchmark elevation (NGVD 29). The well survey data and an updated site map will be uploaded to the GeoTracker system.

Soil and waste water generated during boring activities will be temporarily stored on-site in separate DOT-rated 55-gallon steel drums pending characterization, profiling and transportation to an approved disposal/recycling facility.

Following installation, development, and survey control, the installed wells will be gauged for groundwater elevation and sampled during future quarterly groundwater monitoring events at the Site.

A description of the general field procedures is included in Attachment 2.

3.6 Task 6 – Laboratory Analyses

Collected grab-groundwater samples and representative soil samples, if any, will be submitted to a California state-certified environmental laboratory for analyses. The samples will be analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-g),
- Benzene, toluene, ethylbenzene and total xylenes (BTEX), and
- Fuel oxygenates, additives and lead scavengers including Methyl tertiary Butyl Ether (MtBE), tert-Butyl-Alcohol (TBA), Ethyl tertiary Butyl Ether (EtBE), Isopropyl Ether (DIPE), Methyl tert-Amyl Ether (TAME), 1,2-dichloroethane (1,2-DCA), 1,2-dibromomethane (EDB) and ethanol.

All analyses will be conducted using US EPA Method 8260B.

3.7 Task 7 – Report Preparation

SOMA will prepare a report that will include the following:

- A description of the methods and procedures used to perform the Conduit Study, and the results obtained including a subsurface utility map and a description of the depth to utilities and conclusions and recommendations regarding the potential for underground utilities providing for preferential pathways or pathways that are likely to influence the lateral migration of dissolved-phase hydrocarbons;
- A description of the methods and procedures used to perform the Sensitive Receptor Survey, and the results obtained including a survey map illustrating the survey area, tabulated assessor parcel number (APNs) and owner(s) contacted, questionnaire response results, and a description of water wells located within the survey area, if any;
- A description of the field activities, tabulation of grab-groundwater sample analytical data and soil sample analytical data, if any, maps illustrating the boring locations and lateral/vertical extent of impact, and the locations of the groundwater monitoring wells installed, and conclusions and recommendations based on the data and information derived from the field work and analytical data;
- A Site Conceptual Model with appropriate geologic cross-sections;
- Conclusions regarding the lateral and vertical extent of dissolved phase hydrocarbon impact at the Site and vicinity based on the data and information derived from the Conduit Study, Sensitive Receptor Survey, and field work and analytical data; and,
- Recommendations for an additional assessment, if warranted.

4.0 SCHEDULE

This work plan will be implemented upon receiving written authorization from the RWQCB-SFB. SOMA anticipates that the scope of work described in this work plan will be completed within a time period of eight to ten weeks, under normal conditions, from the date of obtaining necessary approvals, authorizations and permits. Field activities will be scheduled according to the availability of necessary equipment and personnel.

5.0 REFERENCES

RRM, Inc., 2000 “Soil and Groundwater investigation Results, Former Beacon Service Station, 2185 Solano Way, Concord, California”, March 31, 2000.

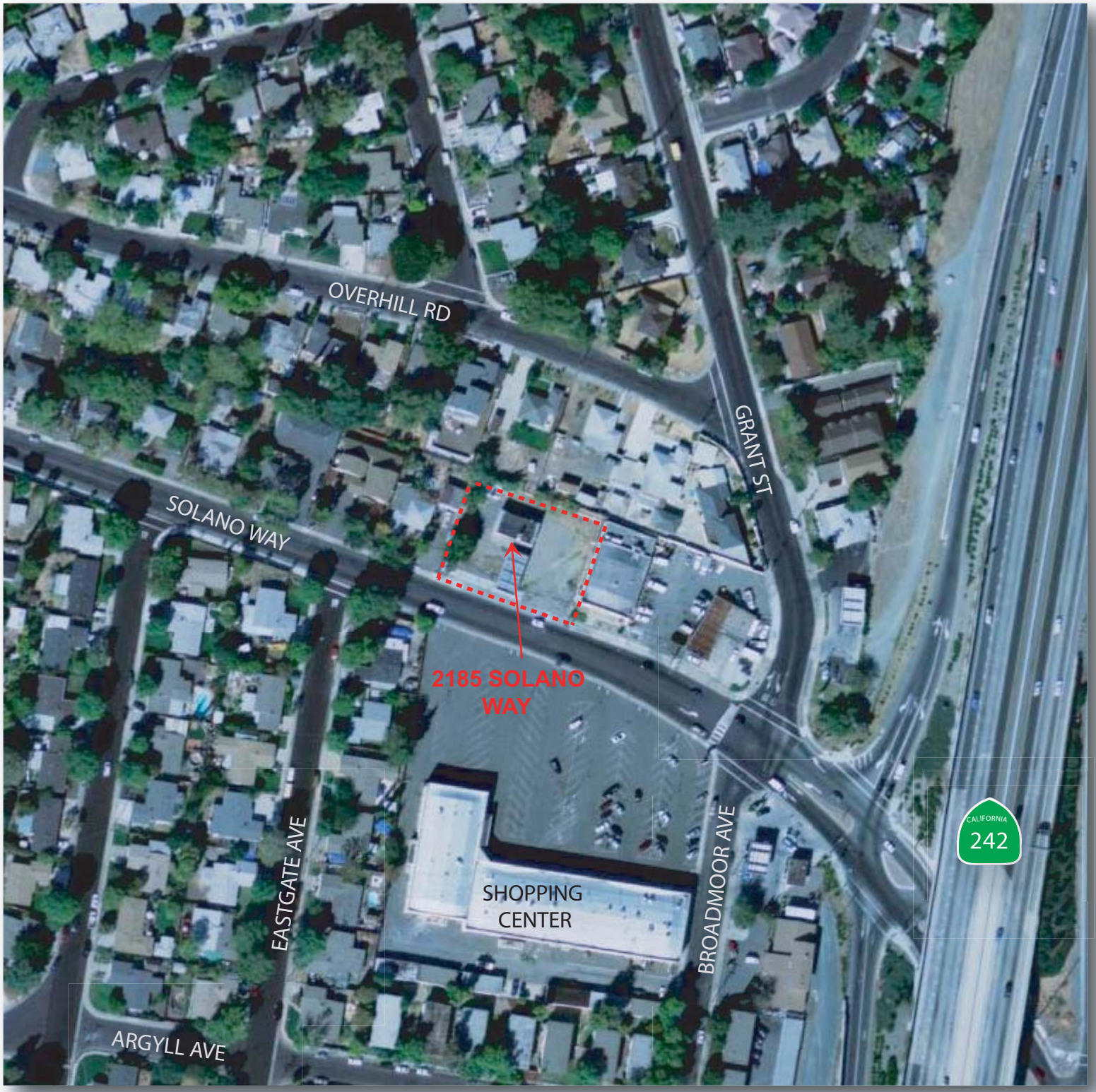
SOMA Environmental Engineering, Inc., 2000, “Soil and Groundwater Investigation at 2185 Solano Way, Concord, California”, October 30, 2000.

SOMA Environmental Engineering, Inc., 2001, “Further Hydrogeologic Investigations and Risk-Based Corrective Action Analysis, 2185 Solano Way, Concord, California”, June 5, 2001.

SOMA Environmental Engineering, Inc., 2001, “Additional Hydrogeological Investigations at Former Beacon Gasoline Service Station, 2185 Solano Way, Concord, California”, February 26, 2002.

SOMA Environmental Engineering, Inc., 2006, “First quarter 2006 Groundwater Monitoring, On-Site Free Product Removal, and Groundwater Remediation Report, 2185 Solano Way, Concord, California”, April 12, 2006.

FIGURES



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approximate scale in feet

0 150 300

Figure 1: Site vicinity map.

SOMA ENVIRONMENTAL ENGINEERING

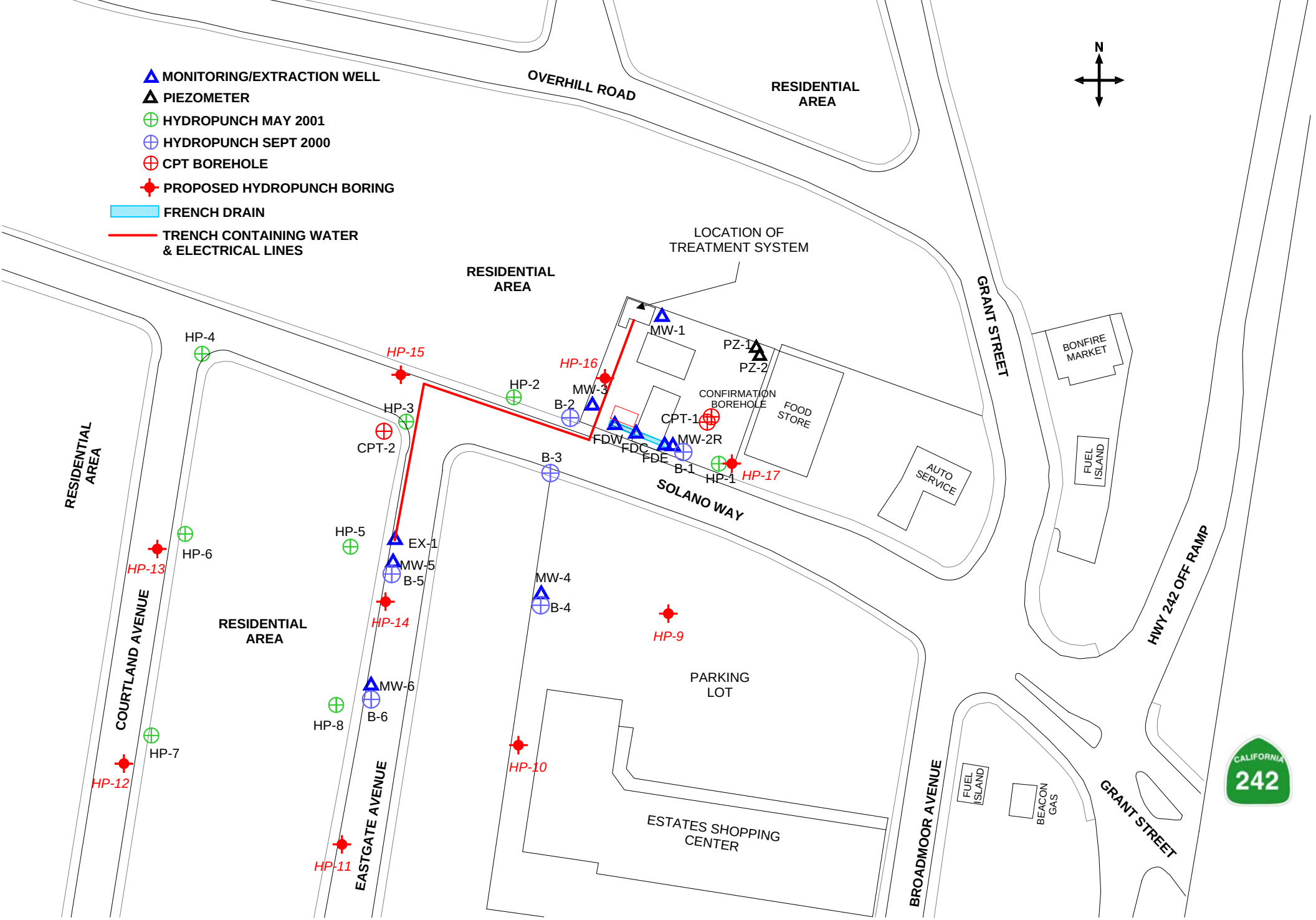

Figure 2: Site map showing locations of proposed HP borings

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ATTACHMENT 1

Public Health

Assessment Questionnaire

PUBLIC HEALTH ASSESSMENT

June 2, 2004

Bob and Carolyn Smith
1420 Easy Street
Millbrae, CA, 94030

SUBJECT: POTENTIAL FUEL CONTAMINATION IN THE VICINITY OF *1420 EASY STREET, MILLBRAE*, CALIFORNIA

Dear *Mr. and Ms. Smith*:

San Mateo County Groundwater Protection Program (GPP) staff have requested a list of receptors that could potentially be affected by *fuel* released from a *service station* located at the intersection of *Moss Street and Orange Avenue in Millbrae*. The attached map shows the location of the *service station* in relation to your property. Please provide the information requested below in the space provided so we can demonstrate to the County you have been contacted. Please only complete Section A if you do not have a well, basement, or a groundwater pumping sump. It is permissible to write "unknown" if you simply don't know.

The results of this assessment will be used to determine if the water in your well or sump or air beneath/within your basement should be tested for the presence of *fuel* compounds. The testing would be free of charge and performed at your convenience. You'll also receive a copy of the laboratory testing report. Please contact *Bob Consultant* of *Triple Q Consulting (xxx-xxx-xxxx)* or *xxxx xxxxxxx* of the GPP *(650-xxx-xxxx)* if you have any questions or concerns regarding this questionnaire.

SECTION A

Street Address of Parcel Surveyed: *1515 Birch Lane, Millbrae* APN: xxx-xxx-xxx

Name of property owner: _____

Owner address: _____

Owner telephone number (if a well, basement, or sump is present): _____

Name of tenant at subject site (if not owner occupied): _____

Tenant telephone number (if a well, basement, or sump is present): _____

Is the subject site used for commercial or residential purposes? _____

Is the property occupied by a multi-family complex (e.g. apartment building)? _____

Is there a well on the property? _____

Is there a basement on the property? _____

Is there a sump on the property that pumps groundwater? _____

continued on the other side

SECTION B (complete if a well exists at the subject site)

Number of wells: _____ Well Diameter(s): _____

Well Depth(s): _____ Pump Depth(s): _____

Material used for the well casing: _____

Date(s) the well(s) were installed: _____

How frequently are the well(s) used? _____

Approximate gallons of water pumped during each well cycle: _____

What is the well water used for? _____

SECTION C (complete if you have a sump which pumps groundwater)

Frequency of Use: _____

Approximate gallons of water pumped from the sump each day: _____

Where is the sump water discharged? _____

Please return this questionnaire in the enclosed self-addressed stamped envelope as soon as possible. A second questionnaire will be mailed to your attention if we do not receive a response within two weeks. Again, please participate for your protection. We welcome any comments you may have on the bottom of this page.

Sincerely,

Bob Consultant
Triple Q Consulting

Additional Comments (if any):

_____
_____
_____
_____
_____
_____
_____
_____
_____

ATTACHMENT 2

Field and Laboratory Procedures

FIELD AND LABORATORY PROCEDURES

Direct-Push, Hydraulic Push (Geoprobe) Drilling and Soil Sampling

Soil borings are advanced using direct-push large bore techniques. Soil sampling is performed using a Large Bore (LB) sampler containing a removable polybutyrate liner. Soil samples are collected at five feet depth intervals to total depth at each boring location. The sampler is driven over the sampling interval by hydraulic ram. The sampler is then retrieved and the liner exposed to extrude the sampled soil. The soil is screened with a Photo-Ionization Detector (PID), and examined and described in accordance with the Unified Soil Classification System. The portion of the liner to be submitted for laboratory analysis is then trimmed to an approximate 6-inch length, covered at both ends with Teflon tape, sealed at both ends with polyethylene end caps, labeled, logged on a chain-of-custody form, and placed in an ice chest containing ice, and kept at 4^0C for transport to the analytical laboratory for analyses.

Alternatively, precleaned push rods (typically one to two inches in diameter) are advanced using a hydraulic push type rig for the purpose of collecting samples and evaluating subsurface conditions. Upon arriving at the designated sampling point, the pointed push tip is retracted to expose the sampler lined with brass, stainless steel or plastic sample tubes. The sampler is pushed, or driven using a hydraulic hammer, into underlying soil approximately 12 to 18 inches to fill the sample tubes. Once the sample is collected, the rods and sampler are retracted and the sample tubes are removed from the sampler head. The sampler head is then cleaned, filled with clean sample tubes, inserted into the borehole and advanced to the next sampling point where the sample collection process is repeated. The soil is screened with a Photo-Ionization Detector (PID), and examined and described in accordance with the Unified Soil Classification System. The portion of the liner to be submitted for laboratory analysis is then trimmed to an approximate 6-inch length, covered at both ends with Teflon tape, sealed at both ends with polyethylene end caps, labeled, logged on a chain-of-custody form, and placed in an ice chest containing ice, and kept at 4^0C for transport to the analytical laboratory for analyses.

Upon completion of drilling and sampling, the rods are retracted, and the resulting borehole is filled with concrete, bentonite grout, hydrated bentonite chips or pellets as required by the regulatory agency. Cement is tremied into place as the push rods are removed. In areas where the borehole penetrates asphalt or concrete, the borehole is capped with an equivalent thickness of asphalt or concrete patch to match finish grade.

Groundwater Sampling

Groundwater samples are collected at each boring location using a Screen Point 15 (SP15) groundwater sampler. Once the sampler is set the screen sleeve was pulled back exposing a five-foot length of slotted PVC screen.

Groundwater samples are collected using a small diameter stainless steel or disposable bailer and transferred to laboratory supplied and preserved glass containers with Teflon lined lids at the base of the bailer, via a Teflon check valve and nipple. Each sample container is completely filled allowing no headspace following placement of the Teflon-lined lid. Following transference, each sample container is labeled, logged on a Chain-Of-Custody form, and placed in an ice chest to be kept at 4^0C during transport to the analytical laboratory. Prior to initial collection and between borings, the stainless steel bailer is field decontaminated to avoid cross-contaminating the collected groundwater samples.

During the sampling process a physical description of observed soil characteristics (i.e. moisture content, consistency, odor, color, etc.), drilling difficulty, and soil type as a function of depth are described on boring logs in accordance with the Unified Soil Classification System (USCS).

No soil cuttings are generated during drilling as the underlying soils are displaced by the push rods. However, hand auger cuttings generated in the upper five feet during the initial utility clearance may be compacted in the upper portion of the hole immediately under the asphalt cap.

Groundwater Monitoring Well Drilling and Soil Sampling

Groundwater monitoring well and soil sampling/exploratory borings are drilled using Hollow-Stem Auger (HSA) drilling equipment. Soil samples from borings are collected at five-foot intervals using a modified California split spoon sampler fitted with three 1-1/2 inch by 6-inch brass or stainless steel liners. Soil samples are collected by advancing the borehole to the desired sampling increment (five-foot intervals) and lowering the modified California sampler through the hollow-stem auger string to the bottom of the borehole. The sampler is then advanced 18-inches ahead of the auger string using a 140-pound hammer. The sampler is then removed from the borehole and hollow-stem auger string and broken down into its component parts. The first, or tip, liner is retrieved for possible laboratory analyses. The collected sample is then labeled, logged on a Chain-Of-Custody form, and placed in an ice chest containing ice, and kept at 4^0C for transport to the analytical laboratory for analyses. The second liner is screened for the presence of fuel hydrocarbon concentrations using a photo-ionization detector (PID). The contents of the second and third liner are extruded and examined to prepare a soil lithologic log for each boring in accordance with the Unified Soil

Classification System, and to inspect the soil for visual evidence of fuel hydrocarbons including staining, discoloration or odors.

Soil cuttings generated during drilling are placed in 55-gallon capacity DOT rated steel drums, labeled, and stored on the Site pending transport for offsite treatment/disposal. Each drum is labeled with date of accumulation, station address, contents, owner, and a contact phone number.

Drill bits, drill stem, drive casing and other tools used in well borehole drilling and soil sampling are thoroughly steam cleaned before initial use and between use at each subsequent well borehole location. The modified California sampling tube and stainless steel liners are washed in clear water, washed in a mixture of Liquinox and clear water, rinsed in clear water, rinsed in distilled water, rinsed in deionized water, and allowed to air dry prior to their initial use, and prior to subsequent use downhole. Water produced during equipment decontamination is contained in 55-gallon capacity DOT rated steel drums, labeled, and stored on the Site pending transport for offsite treatment/disposal. Each drum is labeled with date of accumulation, station address, contents, owner, and a contact phone number.

Groundwater Monitoring Well Installation

In each well boring, when the desired borehole depth is reached, blank casing, screen, filter pack, and bentonite seal are installed inside the HSA auger string. During the installation of well construction materials, the HSA auger string is removed in sequence, leaving the completed monitoring well installation in the borehole. A bentonite/cement grout slurry was then tremied into place to ground surface.

Materials used for constructing each monitoring well include 2 to 4-inch diameter interior/exterior flush threaded NSF approved rigid PVC Schedule 40 well casing and well screen. Well screen perforations are precision machine slotted. Screen slot sizes are 0.02-inch (20 slot) to maximize development of the monitoring well, expedite purging of the well prior to sampling, and lower groundwater entrance velocities thereby minimizing volatilization of groundwater quality samples collected from the monitoring well. The well screen is positioned to provide at least 5 feet of screen length above and below the elevation at which saturated conditions are encountered in the boring during drilling, so as to adequately compensate for any annual fluctuations in the groundwater surface, thereby allowing accurate determination of groundwater elevations at any time of the year, and provide representative groundwater samples. All screen/casing strings are threaded together. The use of solvent glues is not allowed to assemble the screen/casing strings. Filter pack material utilized is clean, rounded, water-worn material, and is installed in the annular space adjacent to the well screen, to a

distance of at least 2-feet above the top of the well screen section. Within the annular space above the filter pack material, a minimum 2-foot thick hydrated bentonite chip seal is placed. The remaining portion of the annular space is sealed with a slurry equivalent to a 10.3 sack mix (188 pounds of sand and 94 pounds of cement per 7 gallons of water) to ground surface. To protect the monitoring wells from accidental damage or tampering, a traffic rated minimum 12-inch diameter utility box with an internal steel protective cover and locking cap is placed over each monitoring wellhead set in concrete and resting flush with existing grade.

All well screen/casing strings are thoroughly steam cleaned prior to insertion in each well borehole. All well construction materials (filter pack, bentonite and cement) are stockpiled away from drilling and sampling activities on polyethylene sheeting and covered to prevent contamination. Each well is completed utilizing rigid NSF approved PVC casing and screen.

Groundwater Monitoring Well Development

Groundwater monitoring wells are developed by mechanically surging the screened portion of each well with a vented surge block, followed by bailing the well to remove material entering the well through the well screen in response to surging operations. Development operations continue until pH, conductivity and temperature readings stabilize to within 10 percent of the previous two readings, or 10 borehole volumes of groundwater have been removed from the well. Temperature, pH and conductivity were measured using a hand-held field meter. The meter was calibrated prior to daily use in accordance with the manufacture's specifications.

Water produced during well development activities is contained in 55-gallon capacity DOT rated steel drums and securely stored on the Site pending transport for offsite treatment/disposal. Each drum is labeled with date of accumulation, street address, contents of the drum, owner, and a contact phone number.

Groundwater Monitoring Well Purging and Sampling

Prior to purging, the monitoring well is evaluated for the presence of LNAPL using an electrical interface probe. Groundwater surface elevation in the monitoring well is then measured. Measurements are made using an electrical water level meter graduated in tenths of inches. The elevations are measured at the top of casing of each well. The top of casing of each well is referenced to the site-specific benchmark.

Each well is then purged of stagnant groundwater prior to sampling utilizing a 2-inch electrical submersible pump to assure the collection of representative samples of groundwater for analyses. Purging continues until pH, conductivity and temperature readings stabilize to within 10 percent of the previous two readings, or 5 borehole volumes of groundwater have been removed from the well. Temperature, pH and conductivity are measured using a hand-held field meter. The meter is calibrated prior to daily use in accordance with the manufacture's specifications. Water produced well purging is contained in 55-gallon capacity DOT rated steel drums and securely stored on the Site pending transport for offsite treatment/disposal. Each drum is labeled with date of accumulation, street address, contents of the drum, owner, and a contact phone number.

Following purging, groundwater samples from each well are collected utilizing a 1-inch diameter by 5-foot long unused, disposable, polyethylene point-source bailer. Groundwater samples are transferred to laboratory supplied and preserved glass containers with Teflon lined lids at the base of the bailer, via a Teflon check valve and nipple. Each sample container was completely filled allowing no headspace following placement of the Teflon-lined lid. Following transference, each sample container was labeled, logged on a Chain-Of-Custody form, and placed in an ice chest to be kept at 4^0C during transport to the analytical laboratory.

Prior to initial use and between subsequent purging events the submersible pump used for well purging is field decontaminated by submerging the pump in a mixture of Liquinox and clear water and pumping approximately 15 gallons of the mixture through the pump and the discharge line. Discharge is contained in a 55-gallon capacity DOT rated steel drum and securely stored on the Site pending transport for offsite treatment/disposal. The drum is labeled with date of accumulation, street address, contents of the drum, owner, and a contact phone number. The pump is then removed and rinsed in clear water, rinsed in distilled water, rinsed in deionized water, and allowed to air dry. The outer casing of the discharge line is washed in clear water, washed in a mixture of Liquinox and clear water, rinsed in clear water, rinsed in distilled water, rinsed in deionized water, and allowed to air dry. At each monitoring well, a clean, unused bailer line was utilized to lower and raise the sampling bailer.